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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/867,362	05/29/2001	Kevin A. Stoodley	CA920000080US1	5656

7590

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EXAMINER
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BANANKHAH, MAJID A

ART UNIT	PAPER NUMBER
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2127

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DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

09/867,362

Applicant(s)

STOODLEY ET AL.

Examin r

Majid A Banankhah

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Pri rity under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This office action is in response to application filed on May 29, 2001. Claims 1-21 are considered for examination.

#### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriarty (U.S. Pat. No. 6,446,149, hereinafter Moriarty).

Per claims 1, 7, 8, 14, 20, and 21, Moriarty teaches:

a computer program product comprising a computer usable medium tangibly embodying computer readable program code for defining code to provide a locking mechanism for self-modifying code in a multi-thread environment (col.5, lines 4-21, **exclusive access to shared critical resource**),

the self-modifying code comprising helper code callable to modify instructions in a defined block of the self-modifying code, said computer program product comprising:

computer readable program code means for defining an atomic compare and exchange instruction in the locking mechanism (col., lines 55 to col. 7 lines 8, **Exchange instruction and algorithm corresponds to the atomic read-modify write cycle and LOCK# signal assertion of FIG. 4**),

the defined atomic compare and exchange instruction for carrying out a comparison of an unreserved lock value with a first instruction In the defined block of self-modifying code, the defined atomic compare and exchange instruction for exchanging the first instruction in the defined block of self-modifying code with a self-loop instruction where the comparison indicates that the unreserved lock value matches the first instruction in the defined block of self-modifying code; computer readable program code means for defining code to return execution to the first instruction in the defined block of self-modifying code where the comparison indicates that the unreserved lock value does not match the first instruction in the defined block of self-modifying code (col. 6, lines 34-54, **Following execution of the compare instruction, the jump not equal instruction is again executed. As long as the semaphore is not equal to `0`, the code continues to loop back to the compare instruction, and col. 7, lines 9-15, a compare instruction for comparing the EAX register, and ); and**

computer readable program code means for defining code to permit the remainder of the helper code to be executed to carry out modifications in the defined block of self-modifying code, including as a last step an atomic store to replace the self-loop instruction with a modified instruction, (col. 5 lines 58- col. 6, lines 23, atomic operation to claim semaphore, and col. 7, lines 52-68).

Moriarty is silent as to the step of “comparison of the lock value matching the first instruction in the defined block of self-modifying code”. However, this step is well known in the art at the time the invention was made for the reason that locking is required for replacing an instruction with a modified instruction. Therefore, it would have been obvious for one ordinary skill in the art at

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the time the invention was made to lock an instruction (comparing the lock value for the match) whenever there is a need for replacing an instruction with a modified instruction.

Per claims 2, 9 and 15, the computer program product of claim 1 further comprising computer readable program code means for defining the first instruction in the defined block of self-modifying code to be a call instruction to the helper code and for defining the unreserved lock value to be calculated in the helper code based on a return call instruction address passed to the helper code (See Moriarty, col. 5 line 58 to col. 6, lines 23, If a semaphore is in a busy state 64, 7a write operation by the busmaster to the semaphore as indicated in step 74 returns the semaphore to an idle state 62. ACQUIRE\_SPINLOCK is a routine provided in Windows NT.RTM. to synchronize access to a shared critical resource such as a shared region in host memory between multiple busmasters).

Per claims 3, 10, and 16, the computer program product of claim 1 further comprising computer readable program code means for defining the first instruction in the defined block of self-modifying code to be a call instruction to the helper code and for storing the unreserved lock value as a binary encoding of the call instruction available to the helper code, Moriarty teaches of storing lock value as a binary instruction in col. 7, lines 2-68.

Per claims 4, 11, and 17, the computer program product of claim 2 in which the helper code is loaded at a non-boundary position in memory, Moriarty teaches of the limitation in col. 5, lines 22-38 (Critical regions of the shared host memory 18 and other shared critical resources in the

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computer system C may be mapped into the self-modifying synchronization memory address space 28 [which is not boundary]).

Per claim 5, 12, and 18, the computer program product of claim 1 further comprising computer readable program code means for defining the first instruction in the defined block of self-modifying code to be an illegal instruction to interact with a defined trap handler to pass control to the helper code, and for defining the unreserved lock value to be the binary encoding of the illegal instruction is taught by Moriarty in col. 7, lines 52-68 (any compare not equal instruction is an illegal instruction).

Per claim 6, 13, and 19, the computer program product of claim 1, in which the helper code replaces unresolved references in the defined block of self-modifying code, is taught by Moriarty in col. 7, lines 52-68 (see, If the semaphore 60 is not equal to '0', the code loops back to the compare instruction which is again executed). In order to execute again one has to store in a defined block of code.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Majid A. Banankhah** whose voice telephone number is (703) 308-6903. A voice mail service is also available at this number.

All response sent to U.S. Mail should be mailed to:

**Commissioner of Patent and Trademarks  
Washington, D.C. 20231**

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**Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington, VA, Six Floor (Receptionist).** All hand-delivered responses will be handled and entered by the docketing personnel. Please do not hand deliver responses to the Examiner.

**All Formal or Official Faxes must be signed and sent to either (703) 308-9051 or (703) 308-9052.** Official faxes will be handled and entered by the docketing personnel. The date of entry will correspond to the actual FAX reception date unless that date is a Saturday, Sunday, or a Federal Holiday within the District of Columbia, in which case the official date of receipt will be the next business day. The application file will be promptly forwarded to the Examiner unless the application file must be sent to another area of the office, e.g., Finance Division for fee charging, etc.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is **(703) 305-9600**.

Majid A. Banankhah

4/5/04

  
MAJID BANANKHAH  
PRIMARY EXAMINER